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MILITARY

JDA UNVEILS FY 1982 BUDGET REQUEST

Tokyo JPE AVIATION REPORT-WEEKLY in English No 537, 9 Sep 81 pp 1-9

[Text] The Japanese Defense Agency (JDA) has announced its FY 1982 budget request, totaling ¥2,580,100 million; up 7.5 percent over FY 1981, giving priority to hastened obtainment of main defense equipment. The total includes ¥295,200 million for the Defense Facilities Administration Agency (DFAA).

The budget request also calls for ¥1,637,600 million in disbursement from FY 1983 on, for the obtaining of equipment. This figure represents a 2.3-fold increase over the current fiscal year.

Requested funds for aircraft obtainment, mostly in disbursement from FY 1983 on, score a conspicuous increase of 7.2 times. Major aircraft for FY 1982 funding include 43 F-15J fighter-interceptors for the Air Self-Defense Force (ASDF), 17 P-3C antisubmarine warfare (ASW) aircraft for the Maritime Self-Defense Force (MSDF) and 22 AH-1S antitank helicopters for the Ground Self-Defense Force (GSDF). Funds for obtaining ammunition also show a notable gain of 83.7 percent.

For service, the GSDF requests a 2.4 percent rise in terms of FY 1982 disbursement alone, the MSDF a 9.2 percent gain, and the ASDF a 13.6 percent increase.

The Technical R&D Institute (TR&DI), seeks a 17.9 percent rise so that its share in the FY 1982 total defense spending would increase to 1.45 percent from 1.31 percent in FY 1981.

The JDA internal bureaus' request scores a sharp 22.5 percent gain because of massive funds for the construction of a central command post.

According to the JDA's FY 1982 operations plan, attached to the budget request, the GSDF will acquire 60 tanks, 14 aircraft, two Tan-SAM short-range surface-to-air missile sets and other equipment in the next fiscal year. GSDF equipment planned for FY 1982 ordering includes: 80 tanks, 19 203mm self-propelled howitzers, 13 command/communications armored personnel carriers, 36 aircraft, improved Hawk surface-to-air missiles for one Hawk group, Tan-SAMs and portable SAMs.

The MSDF will take delivery of seven ships (22,280 tons), 13 aircraft, including five P-3Cs, and other equipment, and order 10 ships (17,430 tons), 39 aircraft (including 17 P-3Cs), and others.

The ASDF will acquire 28 aircraft and other equipment, and place orders for 61 aircraft, Tan-SAMs, portable SAMs, and others.

The TR&DI will launch full-scale development work on the XSSM ground-launched antiship missile, the new main battle tank, the new antiaircraft gun, the Chu-MAT antitank missile and other new weapons systems.

A breakdown of the FY 1982 budget request follows:

(Comparison with previous years)

- Unit: ¥100 mil. -	FY '80 Appropriation	FY '81 Appropriation	FY '82 Request
Total	22,301	23,999	25,801
Compared with previous year	106.5%	107.6%	107.5%
1. JDA & SDF	19,705	21,254	22,849
Compared with previous year	106.4%	107.9%	107.5%
2. DFAA	2,596	2,745	2,952
Compared with previous year	107.4%	105.7%	107.6%

(Organization-by-organization breadown)

- Unit: ¥1 mil. -	FY '82 Request(A)	FY '81 Appropriation(B)	Up (A)-(B)	Up (A)/(B)-100
GSDF	966,878	944,308	22,570	2.4%
MSDF	604,239	553,163	51,076	9.2
ASDF	641,638	564,635	77,003	13.6
sub total	2,212,755	2,062,106	150,649	7.3

- Unit: ¥1 mil. -	FY '82 Request(A)	FY '81 Appropriation(B)	Up (A)-(B)	Up (A)/(B)-100
Internal Bureaus	8,672	7,078	1,594	22.5%
Joint Staff Council	949	905	44	4.8
Defense Staff College	680	649	31	4.7
Defense Academy	9,412	9.041	371	4.1
Defense Medical College	11,131	10,089	1,042	10.3
Technical R&D Institute	37,401	31,711	5,690	17.9
Central Procurement Office	3,900	3,844	56	1.5
sub total	72.145	63,317	8,828	13.9
Total	2,284,900	2,125,423	159,477	7.5

Aircraft

The FY 1982 budget request earmarks ¥774,646 million for 136 aircraft, consisting of 36 for the GSDF, 39 for the MSDF and 61 for the ASDF. If the aircraft request is approved, the JDA is certain to achieve aircraft funding targets stipulated in the FY 1980-84 Medium-Term Defense Program ahead of schedule. The request gives priority to 22 AH-1S antitank helicopters for the GSDF, 17 P-3C anti-submarine patrol aircraft for the MSDF and 43 F-15J fighter-interceptors for the ASDF.

The Aircraft request is broken down as follows:

	Number	Value (mil. yen)	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
GSDF				
AH-1S helicopters	22	42,463	685	41,778
OH-6D helicopters	6	1,222	74	1,148

	Number	Value (mil. yen)	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
HU-1H helicopters	7	3,665	269	3,396
LR-1 turboprop	1	523	35	487
sub total	36	47,873	1,064	46,809
MSDF				
P-3C ASW aircraft	17	188,294	1,073	187,221
KM-2 trainers	2	317	24	293
TC-90 trainers	3	1,514	170	1,344
HSS-2B ASW helicopters	11	28,515	649	27,867
S-61A rescue helicopters	4	6,805	186	6,618
OH-6D helicopters	2	406	25	381
sub total	39	225,850	2,127	223,724
ASDF				
F-15J fighters	43	450,650	4,407	446,243
F-1 support fighters	3	6,970	212	6,758
C-130H transports	4	22,985	1,707	21,277
T-2 advanced trainers	7	16,498	663	15,835
MU-2 rescue aircraft	2	1,062	78	984
V-107A rescue helicopters	2	2,757	208	2,549
sub total	61	500,922	7,277	493,645
Total	136	774,646	10,468	764,178

GSDF Ground Equipment

The FY 1982 budget request sets aside a record ¥52,511 million for Class "A" GSDF ground equipment with the emphasis put on tanks, self-propelled artillery and antitank weapons systems. A new item is the command communications armored personnel carrier (APC) developed by the TR&DI.

The Class "A" GSDF ground equipment request is broken down as follows:

	Number	Value (mil. yen)	FY '82 Expenditure (mi. yen)	Follow-on Disbursement (mil. yen)
New type pistols	1,800	151	0	151
Model 64 rifles	5,000	810	0	810
Model 62 machine guns	51	96	0	96
Model 74 machine guns	38	98	0	98
84mm recoilless guns	221	482	0	482
Model 79 Ju-MAT missile launchers	8 (sets)	487	0	487
Model 64 81mm mortars	43	120	0	120
Model 75 155mm self-propelled howitzers	40	10,984	0	10,984
203mm self-propelled howitzers	19	5,534	235	5,299
Model 75 130mm multi-barreled rocket launchers	8	1,632	0	1,632
Model 75 wind measuring vehicles	3	338	0	338
Model 74 tanks	80	27,638	0	27,638

	Number	Value (mil. yen)	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
Model 73 APCs	9	899	0	899
Command/ communications APCs	13	1,024	0	1,024
Model 78 tank recovery vehicles	5	1,135	0	1,135
Model 78 snow vehicles	22	599	0	599
Model 70 pontoons	3	483	0	483
Total		52,511	235	52,276

Shipbuilding

The FY 1982 MSDF shipbuilding request calls for ¥252,778 million, compared with ¥194,901 million in FY 1981, to finance building of 10 warships, five auxiliary vessels and a DSRV (deep submergence rescue vehicle) for a 3,600-ton AS submarine tender, and rehabilitation and modernization of two ships. The 10 warships include four 2,900-ton DDs, and one 1,400-ton DE destroyer. The five auxiliary vessels are one 490-ton YO fuel oil barge, one 270-ton YO, one 200-ton YT tugboat, one 30-ton YT and one 50-ton YL salvage lift. The 15 ships' tonnage amounts to 18,470 tons.

A new item in the 10 warships is a 250-ton PG missile-armed patrol gunboat for pre-deployment evaluation.

The MSDF shipbuilding request is broken down as follows:

	Number	Tonnage	Value (mil. yen)	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
2,900-ton DDs	4	11,600	147,972	2,586	145,387
1,400-ton DE	1	1,400	20,157	601	19,556
2,200-ton SS	1	2,200	31,472	327	31,146

	Number	Tonnage	Value (mil. yen)	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
440-ton MSCs	2	880	9,135	15	9,120
250-ton PG	1	250	2,788	265	2,523
1,100-ton AGS	1	1,100	7,017	654	6,364
DSRV	-	-	14,371	552	13,819
sub total	10	17,430	232,912	4,998	227,914
Auxiliary ships	5	1,040	1,093	741	352
FRAM program			18,773	1,119	17,654
Total	15	18,470	252,778	6,858	245,920

Military R&D

The TR&DI's FY 1982 budget request totals ¥37,401 million; up 17.9 percent over FY 1981, including ¥16,886 million for research and development of new defense equipment. In addition, it requests ¥34,631 million in disbursement from FY 1983 on for R&D programs.

Major R&D items for FY 1982 include: the XSSM ground-launched antiship missile, the Chu-MAT medium-range antitank missile, the portable SAM, the air combat missile, the new antimortar radar, the ALR-1, ALQ-5 and ALQ-8 electronic countermeasure systems, the new main battle tank, the AW-X self-propelled antiaircraft gun, the new mortar (and its ammunition), the 20mm projectile, the new diesel engine for minesweepers, the towed passive sonar, the GRX-2 high-speed homing torpedo, the highly tensile rolled steel for future submarines, the ship noise reduction measures, the deep-minesweeping system, the new mine, the MT-X intermediate trainer and the target drone.

The main part of the requested R&D funds is broken down in categories as follows:

	Number of R&D items	FY '82 Expenditure (mil. yen)	Follow-on Disbursement (mil. yen)
Guided weapons	8	1,526	8,109
Electronic equipment	14	1,565	4,169
Firearms and vehicles	7	1,888	11,284
Ships and underwater weapons	10	1,464	2,450
Aircraft	4	980	6,605
Total	43	7,423	32,617

Guided Weapons

The FY 1982 budget request earmarks ¥70,182 million (¥4,879 million in FY 1982 expenditure) for Nike-J, improved Hawk, Tan-SAM short-range and portable surface-to-air missiles. The total consists of ¥30,880 million (¥1,369 million in FY 1982 expenditure) for GSDF improved Hawks, ¥669 million (¥201 million) for ASDF Nike-Js, ¥35,549 million (¥1,767 million) for 12 Tan-SAM sets, and ¥3,084 million (¥1,542 million) for 88 portable SAM sets.

The GSDF improved Hawks will be used for modernization of the fifth Hawk group. The Nike-J request will be for improving radar equipment. The Tan-SAM and portable SAM missiles will be deployed for northern GSDF divisions and ASDF bases.

Command/Communications Systems

The JDA requests ¥2,061 million in FY 1982 expenditure and ¥4,698 million in follow-on disbursement for the construction of a central command post for a unified command of the three SDF services. Obtainment of hardware equipment and additional construction work are planned for FY 1982 after construction of a building at the JDA.

The central command post, to be completed in FY 1983, will link the ASDF BADGE air defense system, the GSDF microwave communications system and the MSDF SF fleet command and support system.

The JDA also earmarks in the FY 1982 budget request ¥1,981 million in FY 1982 expenditure and ¥3,502 million in follow-on disbursement for the final-phase construction of the GSDF microwave communications system.

As for the ASDF BADGE system, the JDA plans to select a new system in FY 1982 before its construction from FY 1983 to 1987.

CSO: 4120/3

SCIENCE AND TECHNOLOGY

ECONOMY OF COAL UTILIZATION, FUTURE PROSPECTS

Tokyo SHO-ENERUGI in Japanese Vol 33, No 3, Mar 81 pp 6-13

[Article by Akira Senmura, head scientist at Japan Energy Economics Institute]

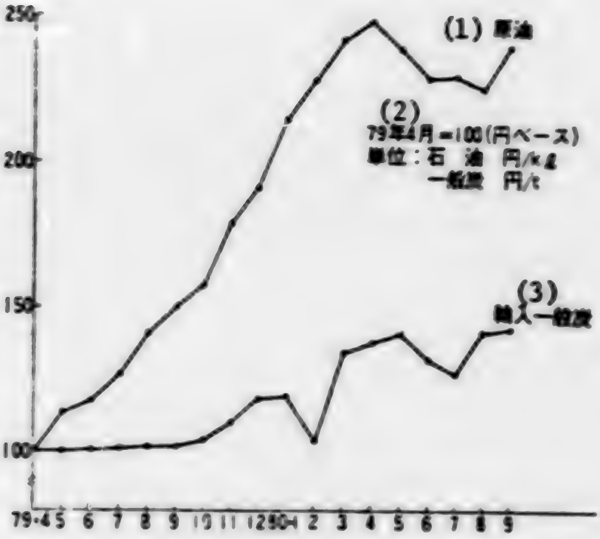
[Text] 1. Present Economic Characteristics of Coal Use

1-1 Overview

The desire to reconsider coal has grown rapidly since the autumn of 1979. The greatest factor in this increase is, if anything, the jump in oil prices which followed the Iranian revolution and the resulting second oil crisis; coal prices were stable by comparison, and the use of coal became markedly more economical. As shown in Table 1 the CIF price of crude oil increased by about 120 percent from $15.40/barrel in April 1979 to $34.60/barrel, while the CIF price of coal increased only about 40 percent during the same period, from $41.33/ton to $58.59/ton. Moreover, between April and December of 1979, crude oil had made a sharp jump of 60 percent to $25.36/barrel but coal remained almost level, increasing 2 percent to $42.47/ton. Because of this difference in price trends during that period, coal use became markedly more economical and the desire to reconsider coal became much more widespread.

Figure 1, in which CIF prices are indexed at 100 as of April 1979, clearly shows the difference between crude oil and coal price increases between 1979 and the beginning of 1980, and the greatly increased price superiority of coal. When the unit price per 10^3 kcal is compared (after figuring in a 20-percent penalty against coal for inconvenience of handling), the unit price of coal was 83 percent that of crude oil in April 1979 but 46 percent that of crude oil in January 1980. Thus the advantage of using coal increased greatly.

With this marked increase in the economic advantage of using coal in 1979 in the background, the cement industry and others in Japan became involved in a fierce struggle to buy up coal from overseas from the beginning of 1979 through the beginning of 1980; as a result the price of coal, which had been about $40/ton in the first quarter, ranged up between $47 and $59 in the last three quarters of that year.



Key:
1. Crude oil
2. Apr 79 = 100 (yen based); unit: yen/kl oil, yen/ton coal
3. Import coal

Figure 1. Price Trend of Crude Oil and Coal

Table 1. Trend of CIF Prices of Crude Oil and Coal

(1) 年 月	原 (2) 油		(5) 一 般 炭		輸入レート (8)
	ドル(3) /バレル	(4) 円/kl	(6) 円価格	(7) ドル価格	円/ドル
'79年4月	15.40	20,428	8,715	41.33	210.87
5月	16.62	22,764	8,721	40.04	217.81
6月	17.29	23,901	8,774	39.91	219.63
7月	18.75	25,617	8,846	40.72	217.24
(9) 8月	21.18	28,701	9,223	42.67	216.13
9月	22.06	30,605	8,888	40.30	220.54
10月	22.72	32,210	9,126	40.49	225.41
11月	24.37	36,557	9,682	40.60	238.48
12月	25.36	39,013	10,389	42.47	244.62
'80年1月	29.20	43,651	10,438	43.92	237.68
2月	30.83	46,606	9,160	38.11	240.35
3月	31.75	49,421	11,715	47.34	247.44
4月	31.91	50,666	12,053	47.76	252.39
5月	32.49	48,781	12,280	51.44	238.71
6月	33.45	45,591	11,533	52.08	221.44
7月	34.17	46,849	11,028	50.60	217.95
8月	33.96	48,027	12,738	56.65	224.85
9月	34.60	48,929	12,837	58.59	219.10

出所：日本貿易月表 (10)

Key:
1. Month
2. Crude oil
3. Dollars/barrel
4. Yen/kl
5. Coal
6. Yen price
7. Dollar price
8. Import exchange rate--yen/dollar
9. Apr 79, May 79 ... Sep 80
10. Source: Japan Monthly Trade Statistics

The increase was not so great on a yen basis because of the appreciation of the yen during that period; between January and September of 1980 it was 33 percent on a dollar basis, but only 23 percent on a yen basis. Thus in September 1980 the unit price of 10^3 kcal in crude oil was 5.21 yen but for coal (including the 20-percent penalty) it was 2.65 yen--51 percent of the crude oil price. This is almost the same as the 52 percent in December 1979. This means that even though the large increase in the import price of crude oil caused the import price of coal to go up from March 1980 on, the price differential remained about the same as at the end of 1979, so the use of coal continued to be very economical.

Because of the economic advantage of using coal there are many customers who would like to use it, but despite the great potential demand for coal, the supply systems in Australia and other producer countries make it impossible for supply to meet demand. Thus spot purchases are made at unreasonably high prices, driving up the market price of coal.

Let us examine how the potential demand for coal came to be so great. Table 2 shows coal imports by country of origin: imports of coal began to increase in the second half of fiscal 1979 and the primary source was Australia. As stated above, this reflected the increased economic advantage of using coal seen in 1979. Only Australia was able to immediately increase supplies to meet the increased demand in Japan. These increased imports of coal from Australia and the other sources, were, however, the result of excessive competition in buying coal which pushed coal prices up.

Table 2. Trend of Import Coal Receipts

(1) (単位：千t)

	(2) 国別	(3) 53 年度			(7) 54 年度			(8) 55年度
		(4) 上期	(5) 下期	(6) 計	(4) 上期	(5) 下期	(6) 計	(4) 上期
(9)	中国	71.4	110.1	181.5	118.1	121.1	239.2	363.2
(10)	ソ連	83.2	40.2	123.5	29.2	94.6	123.8	110.3
(11)	豪州	327.6	340.8	668.4	441.0	845.8	1,286.8	1,620.1
(12)	南アフリカ	5.4	19.5	24.9	21.0	—	21.0	85.6
(13)	カナダ	—	12.2	12.2	0.2	—	0.2	144.0
(14)	米国	—	—	—	—	—	—	38.4
(15)	インドネシア	—	—	—	3.8	—	3.8	9.0
(16)	計	487.6	522.9	1,010.5	613.2	1,061.5	1,674.7	2,440.7

Key:

1. (Unit: 1,000 tons)
2. Country
3. Fiscal 1978
4. First half
5. Second half
6. Total
7. Fiscal 1979
8. Fiscal 1980
9. PRC
10. Soviet Union
11. Australia
12. South Africa
13. Canada
14. U.S.
15. Indonesia
16. Total

Industry-by-industry trends in the consumption of imported coal show that in the last half of fiscal 1979 consumption increased greatly in the glass and ceramics industry--specifically the cement industry. In the cement industry, SO_x and ash are mixed into the raw material so NO_x regulations are the only problem in terms of environmental protection, and conversion to coal is relatively easy because the only facilities needed are a coal crushing mill and a coal burner and because it is not necessary to consume large amounts. Moreover, the cost of kilning the raw materials makes up 40 to 50 percent of the cost of producing cement, so the major task of management is to reduce production costs by using the cheapest fuel possible. It is for these reasons that cement is the industry that has gone the furthest in conversion to coal. In August and September 1979 the cement industry was consuming about 400,000 tons per month, an annual rate of 4.8 million tons of coal. It is safe to say the cement industry has almost achieved its planned goal of 50 percent conversion to coal in the first year. After the cement industry, the greatest effort to convert to coal is seen in the electric power industry. In July 1980 consumption of imported coal by the power industry rose to 100,000 tons per month; in the first half of fiscal 1980 it used about 430,000 tons, some four times the 100,000 tons used in the second half of fiscal 1979. Some oil-burning thermoelectric power plants were originally designed to burn coal and later converted to oil.

Reconversion of these plants and raising the proportion of coal burned at the coal burning plants brought about this increase in coal consumption. Incidentally, the full-scale construction of import coal burning power plants has had to await the Matsushima No 1 plant of the Electric Power Development Co., scheduled to begin operation in January 1981. Other manufacturing industries doubled their consumption of imported coal to 190,000 tons in the first half of fiscal 1980 from 90,000 tons in the latter half of 1979, but the amount is quite small in comparison with consumption by the cement and power industries.

As stated above, on the occasion of the second oil crisis the cement industry quickly began conversion to coal in the latter half of fiscal 1979; this reflected the marked increase in the economic advantages of using coal. The electric power industry is also converting to coal, but it has not been possible to secure supplies adequate to meet the deep-rooted potential demand for coal. This has not only driven up the market price of ordinary coal, but has affected the price of coking coal as well.

1-2 Economy of Expanded Coal Use in Major Industries

Let us now consider the economic advantages of expanded use of coal in major industries based on the fuel price assumptions in Table 3.

(1) Steel Industry

Conversion to oil-less blast furnace operation--all coke operation--without fuel oil--became widespread in the steel industry from the fall of 1979 through the first half of 1980.

Table 3. Fuel Price Assumptions

(1)	C重油 (S分3%)	(2) C重油 (S分0.3%)	(3) 海外一般炭	(4) 国内一般炭
	33,000円/kl (5)	39,900円/kl (5)	16,500円/t (6)	19,000円/t (6)

(7) 注1) H.S.C重油については55年10～12月期鉄鋼向け価格

(8) 注2) L.S.C重油については55年10～12月期電力向け仮払い価格

(9) 注3) 海外一般炭と国内一般炭については、55年9月時点での工場着のモデル工場着価格

Key:

1. C fuel oil (sulfur content 3%)
2. C fuel oil (sulfur content 0.3%)
3. Imported coal
4. Domestic coal
5. Yen/kl
6. Yen/ton
7. Note 1) 4th quarter price of high sulfur C fuel oil for steel makers, 1980
8. Note 2) 4th quarter price of low sulfur C fuel oil for power companies, 1980
9. Note 3) model delivered prices of imported and domestic coal as of September 1980

Table 4 shows blast furnace operation by fuel type for the five major operators (as of the end of October 1980): of the 38 furnaces being used, 20 were on all coke operation. If we include those which made use of tar produced as a byproduct of coke furnaces, there were 24 oil-less blast furnaces, or 63 percent of the 38 furnaces in operation. Thus for every 35 kg of fuel oil the five major steel producers used in 1978 before the second oil crisis, they used 10 kg, less than one-third, in October of 1980.

Table 4. Major Steel Makers' Blast Furnace Operations by Fuel

(1) 会社名	(2) 稼働中の高炉数	(3) 重油吹込み	(4) オールコークス	(5) タール吹込み
(6) 新日本製鉄	16	8	7	1
(7) 日本鋼管	5	0	4	1
(8) 川崎製鉄	6	1	5	0
(9) 住友金属工業	6	3	1	2
(10) 神戸製鋼	5	2	3	0
(11) 合計	38	14	20	4

(12)(昭和55年10月末現在)

Key:

1. Company
2. Furnaces in operation
3. Fuel oil blown in
4. All coke
5. Tar blown in
6. Nippon Steel Corp.
7. Nippon Kokan K.K.
8. Kawasaki Steel Corp.
9. Sumitomo Metal Industries
10. Kobe Steel Ltd.
11. Total
12. (as of the end of October 1980)

By contrast, the relative amount of coke used rose from 426 kg in 1978 to 455 kg in November 1980. But even though the relative amount of coke used rose, because it is far more economical than fuel oil profits rose to 643 yen per ton or 55.9 billion yen per year for the entire industry, as shown in Table 5. This does not include profit from the increase in gas generated as a byproduct of coke use; if this gas were valued by calorie equivalency to heavy oil, the merits of coal conversion would be further increased.

Table 5. Advantage of Expanded Coal Use to Steel Industry (1980)

	高炉燃料比 (1)（kg）	燃料単価 (2)（円/t）	燃料費 (3)（円/t）
コ(4)ークス	455 426	20 20	9,100 8,520
重(5)油	10 35	53 53	530 1,855
タ(6)ール	7 5	51 51	357 255
(7)計	472 466		9,987 10,630

(8)注1）上段の高炉燃料比は55年11月の大手5社の実績
(9)注2）下段の高炉燃料比は53年の実績
(10)注3）タールの価格は重油とカロリー等価とする

(11) t当り利益（円/t）	(12) 高炉銑（万t）	(13) 総利益（億円）
643	8,700	559

Key:

1. Blast furance fuel use (kg)
2. Unit cost of fuel (yen/ton)
3. Fuel cost (yen/ton)
4. Coke
5. Fuel oil
6. Tar
7. Total
8. Note 1) Upper figure is November 1980 average of the five major steel makers
9. Note 2) Lower figure is the 1978 average
10. Note 3) Tar cost based on calorie equivalent of fuel oil
11. Profit per ton (yen/ton)
12. Blast furnace pigs (10,000/t)
13. Total profit (100 million yen)

(2) Electric Power Industry

Tables 6 and 7 compare the first year cost of producing 1 million kilowatts in 1980: atomic energy is lowest at 11 yen/kWh (all figures exclude transmission costs), followed by coal at 14 yen/kWh, and LNG and fuel oil at the relatively high levels of 17 and 19 yen/kWh.

Breaking down these costs, we see that for generation of power from LNG and heavy oil, the proportion of capital costs is low--18 to 27 percent--and fuel costs make up a large share--65 to 75 percent. By contrast, capital costs for coal and atomic energy are high--38 to 59 percent--and fuel costs are lower at 24 to 38 percent. In other words, low fuel costs make up for the high construction costs of coal and atomic power plants and allow power generation at a low cost. Thus the best course for the power industry would be to go ahead with construction of atomic facilities to produce low cost electricity, but in practice the siting of atomic power plants is greatly delayed by strong antinuclear sentiment among local residents. Although coal, on the other hand, still has a dirty image, the use of integrated exhaust treatment systems has made it possible to apply environmental regulations comparable to those for oil-burning power plants, and so construction of coal-burning plants is going forward actively.

But power from coal is faced with more than a few problems: in addition to the image among the citizenry as a polluter, coal requires extensive harbor facilities and twice as much land as oil-burning facilities. Construction is not going forward as rapidly as planned; coal faces the siting difficulties as other sources of electricity.

Table 6. Relative Cost of Generating Electricity (First Year Cost per 100 kW If Operation Begun in 1980)

(1) 項　目	(2) 原子力			(3) LNG火力			(4) 重油火力			(5) 石炭火力			(6) 備考
(7) 建設費（億円）		2,300			1,610			1,220			2,010		設備利用率70% 熱効率 38% 建設費 ①石炭火力本体 重油火力本体×1.45 ②LNG（含.基地建設費） 重油火力本体×1.35 (15)
(8) 発電所本体		2,300			1,110			1,190			1,730		
(9) 排煙装置・LNG基地					500			30			280		
(10) 所内率		3.0			2.1			3.4			7.6		
(11) 発電電力量（×10⁶kWh）		6,132			6,132			6,132			6,132		
(12) 送電電力量（×10⁶kWh）		5,948			6,003			5,924			5,666		
(13) 燃料発熱量					13,300kcal/kg			9,700kcal/l			6,450kcal/kg		
(14) 燃料消費量					104万t			143万kl			231万t（豪炭ベース）		
(16) 初年度コスト（百万円）	経費率(17)		%	経費率(17)		%	経費率(17)		%	経費率(17)		%	
(18) 資本費	0.1734	39,882	58.6	0.174	28,014	27.9	0.174	20,706	18.3	0.174	30,102	37.6	
(19) 運転費	0.0524	12,052	17.7	0.0424	6,826	6.8	0.0424	5,046	4.5	0.0424	7,335	9.2	
(20) 排煙処理費		—			—			1,901	1.7		12,044	15.0	
(21) 灰捨処分費		—			—			—			520	0.6	
(22) 燃料費		16,167	23.7		65,520	65.3		85,657	75.6		30,030	37.5	
(23) 計（発電端）		68,101 (11.11円/kWh) (24)			100,360 (16.37円/kWh) (24)			113,310(18.48)			80,031(13.05)		
(25) 計（送電端）		68,101 (11.45円/kWh) (24)			100,360(16.72)			113,310(19.12)			80,031(14.12)		

Key:

1. Item
2. Atomic energy
3. LNG fired
4. Fuel oil fired
5. Coal fired
6. Notes
7. Construction cost (100 million yen)
8. Power plant building
9. Exhaust equipment - LNG base
10. Proportion
11. Power generated (x 10^6 kWh)
12. Power transmitted (x 10^6 kWh)
13. Heat from fuel
14. Fuel used
15. Facility utilization 70%; thermal efficiency 38%; construction cost: (1) coal fired plant is 1.45 times cost of fuel oil fired plant, (2) LNG (including cost of base construction) plant is 1.35 times cost of fuel oil fired plant
16. First year cost (million yen)
17. Outlay rate
18. Capital costs
19. Operating costs
20. Pollution control costs
21. Clinker disposal costs
22. Fuel costs
23. Total (at generator)
24. yen/kWh
25. Total (at transmission point)

Table 7. Power Cost Comparison Premises

	(1) 原子力	(2) LNG火力	(3) 重油火力	(4) 石炭火力
(5) ケース設定	従来計算方式による（除、デコミッショニングコスト、及び低レベル放射性廃棄物の管理コスト） (6)	(7)	脱硝：50%装備 脱硫：装備せず LS重油にて対応	脱硝 脱硫 } 100%装備 (8)
(9) 燃料価格	(A) 表 (10)	63,000円/t (11) （55年9月のCIF価格）	59,900円/kl (12)	13,000円/t （55年9月のCIF価格） (13)

(A) 核燃料サイクルの諸費用見通し (10)

(10a) ウラン精鉱		(10b) 転換	(10c) 濃縮	(10d) 成型加工	(10e) 使用済燃料輸送	(10f) 再処理
$/lb$U_3O_8$	$/kg$U_3O_8$	$/kg-U	$/kg-SWU	$/kg-U	$/kg-U	$/kg-U
32	70	6	98	417	140	700

(14) 注）炉心滞在は4年、転換、濃縮は初装荷の2年前、成型加工はその1年前と想定した。また使用済燃料を炉からとりだし輸送するまでの期間は1年、また再処理の終了時点までの期間は2年と想定した。なお長期割引き利率は8%と想定した。
主な炉特性データは熱効率33.2%、燃焼度29,500MWD/t、設備利用率70%、初装荷量108.55t

Key:

1. Atomic energy
2. LNG fired
3. Fuel oil fired
4. Coal fired
5. Case
6. Conventional method of calculation (less decommissioning cost and cost of handling low level radioactive wastes)
7. 50% of nitrate removal equipment but no sulfate removal equipment—low sulfur fuel oil assumed
8. 100% of nitrate and sulfate removal equipment
9. Fuel cost
10. Cost forecast for phases of nuclear fuel cycle:

10a. Uranium milling
10b. Conversion
10c. Enrichment
10d. Fuel fabrication
10e. Spent fuel transportation
10f. Reprocessing

11. Yen/ton (September 1980 CIF price)
12. Yen/kl
13. Yen/ton (September 1980 CIF price)
14. Note) Time in reactor core is assumed to be 4 years, with conversion and enrichment taking place 2 years before initial loading and fuel fabrication 1 year before loading. It is assumed transportation is 1 year following removal of spent fuel from reactor and that reprocessing is completed 2 years after removal. The long term return rate is 8%. Reactor characteristics are 33.2% fuel efficiency, 29,500 MWD/t combustion, 70% facility utilization, and 108.55 t initial load.

(3) Cement Industry

As stated above, cement is the industrial sector in which conversion to coal has proceeded most rapidly. Table 8 shows that under the plan for 50 percent conversion to coal during fiscal 1980 there are great advantages: the 96.9 billion yen gained from coal conversion allows recovery of the investment in conversion (87.0 to 129.0 billion yen) in about 1 year. The cement industry plans to achieve 90 percent conversion as quickly as possible, and its coal consumption will be in excess of 10 million tons. But because Australian coal, including newly exploited coal, has been sold up through 1984, it will be difficult to secure supplies adequate for the needs of the cement industry.

Even so, it is possible to post adequate profit from company income using 6 million tons of coal with 50 percent coal conversion in 1980; the cement industry has recently taken a relatively calm and settled attitude toward the tight market conditions for coal.

Table 8. Advantage of Coal Conversion to Cement Industry

(1) クリンカー生産量 (万t)	(2) 重油原単位 (l/t)	(3) 重油必要量 (万kl)	(4) 石炭換算必要量 (万t)	(5) 石炭消費量 (万t) 重油消費量 (万kl)
8,850	87	770	1,261	630 385

(6)注）石炭転換率は50%

(7) ① 燃料費 (億円)	② 差(8)額 (億円)	③ 転換(9)投資額 (億円)	(10)④=③/② (年)
3,112 (4,081)	969	870~1,290	0.90~1.33

(11)注1）石炭価格は海外炭80%、国内炭20%の加重平均
(12)注2）転換投資額は興銀調べと開銀調べ
(13)注3）（　）内は重油専焼の場合で、差額は石炭転換率50%の場合と重油専焼の場合との差

Key:
1. Clinker produced (10,000 tons)
2. Fuel oil source unit (liter/ton)
3. Fuel oil required (10,000 kl)
4. Coal required under conversion (10,000 tons)
5. Coal consumed (10,000 tons)
   Fuel oil consumed (10,000 kl)
6. Note) 50% conversion to coal
7. Fuel cost (100 million yen)
8. Difference (100 million yen)
9. Investment in conversion (100 million yen)
10. (year)
11. Note 1) Coal cost is weighted balance of 80% imported coal and 20% domestic coal
12. Note 2) Amount to be invested in conversion based on studies by Industrial Promotion Bank and the Japan Development Bank
13. Note 3) The figure in parentheses is the difference between the cost if just fuel oil is burned and the cost with 50% conversion to coal

(4) Paper and Pulp Industry

Table 9 shows that in the case of a new 260 t/h boiler, the unit cost of steam is 4,310 yen/ton with a heavy oil boiler and 4,210 yen/ton with a coal boiler, so new coal-fired boilers have the advantage. In fact, five new coal boilers are planned for construction by fiscal 1985: 250 t/h at Daishowa Paper's Iwanuma mill, 300 t/h at Sanyo-Kokusaku's Yufutsu mill, 200 t/h at Mitsubishi Paper's Hachinohe mill, 350 t/h at Daio Paper's Mishima mill and 200 t/h at Otake Industries.

Table 9. Steam Cost Comparison for New Boilers in the Paper and Pulp Industry

		(1) 1980 年 完 成		
		重油ボイラ (2)	石炭ボイラ (3)	(4) 摘 要
(5) 建 設 費 (A)		29.5	88.48	脱硝あり (6)
(7) 固 定 費	(8) 資 本 費	6.49	18.01	
	(9) 直接費 人件費	0.32	0.64	重油 2名×4直×@400万円 石炭 4名×4直×@400万円 (19)
	修繕費	0.59	2.21	重油 (A)×2% 石炭 (A)×2.5% (20)
	(10) 間 接 費	0.14	0.43	直接費計×15% (21)
	(11) 計 (B)	7.54	21.29	
(12) 比 例 費	(13) 燃 料 費	63.75	39.6	燃料単価 重油14.5t/kl, 石炭 7.5t/t, 負荷率 0.8, 稼働日 350日 (22)
	(14) 電 力 費	3.96	7.92	重油 1,300kW 石炭 2,600kW ×24×350×12.95円/kWh (23)
	(15) 脱 硝 費	—	2.0	
	(16) 灰 処 理 費	—	2.8	
	計 (C) (17)	67.71	52.32	
(B) + (C)		75.25	73.61	発生蒸気量 260t/h×0.8×24×350 (24) =1,747,200t/年
(18) 蒸 気 単 価 (千円/t)		4.31	4.21	

Key:

1. Completed in 1980
2. Fuel oil fired boilers
3. Coal fired boilers
4. Notes
5. Construction costs (A)
6. With NOx removal equipment
7. Fixed costs
8. Capital costs
9. Direct costs--personnel costs
   --maintenance costs
10. Indirect costs
11. Total (B)
12. Variable costs
13. Fuel costs
14. Electricity
15. NOx removal

[Key continued on following page]

16. Ash disposal
17. Total (C)
18. Unit cost of steam (1,000 yen/ton)
19. —fuel oil: 2 men x 4 shifts x 4 million yen
    —coal : 4 men x 4 shifts x 4 million yen
20. —fuel oil: (A) x 2.0%
    —coal : (A) x 2.5%
21. Total of direct costs x 15%
22. Steam generation capacity 14.5 t/kl for fuel oil, 7.5 t/t for coal, load factor 0.8, days of operation 350
23. —fuel oil: 1,300 kW x 24 x 350 x 13.95 yen/kWh
    —coal : 2,600 kW x 24 x 350 x 13.95 yen/kWh
24. Volume of steam 260 t/h x 0.8 x 24 x 350 = 1,747,200 t/yr

So far the paper and pulp industry has been considering conversion to coal in the form of reactivation or reserve coal-fired boilers which had been retired but not dismantled, or reconversion of coal-fired boilers which had been converted to burn fuel oil, but now we can expect new large-scale coal boilers to be built. But under present conditions it will not be easy for the paper and pulp industry to secure supplies of coal which will be consumed in large quantities by the large boilers.

Additional difficulties faced by the paper industry are the fact that almost no mills are located near the coast and the fact that individual mills consume only small quantities of coal. Expanded use of coal will therefore require establishment of coal centers and secondary transportation facilities.

2. Prospects for Economy of Expanded Coal Use

2-1 Short Range Prospects (1980-85)

Japan depends primarily on coal from Australia and that, newly exploited fields, has been sold out through 1984; it is not possible to secure supplies, beyond what is now under contract, from any company. Moreover, the existing U.S. coal terminals at Los Angeles and Long Beach are at the limits of their loading capacity.

In the PRC there will be a considerable delay in the expansion of the ports of Qinhuangdao and Shijiusuo which is being done with financial assistance in the form of yen loans, and in the building or electrification of connecting railroads. Infrastructure facilities are being provided for Canadian coking coal, but deposits are not large. It will thus be necessary to overcome numerous obstacles in order to greatly increase supplies of coal from countries other than Australia. And because that will take a long time, it would be quite difficult to expect a large supply of non-Australian coal by 1985.

Consequently it will be difficult to increase the supply of coal much above present levels prior to 1985. But considering the strong potential demand for coal, even a cautious attitude on the part of the cement industry and other coal users cannot prevent spot purchases at high prices, and sporatic spot purchases at high prices will pull up the market price of coal. And that may well pull up coal contract prices, including those of long term contracts.

In short, there is no hope for increased suppliers of coal prior to 1985, and assuming active coal purchasing from Europe and Southeast Asia as well as from Japanese consumers, there should be a considerable increase in the price of coal. However, increased purchases of Australian coal by the countries of Europe are due largely to short range factors like reduced exports of Polish and Soviet coal, and the Japanese cement industry and other coal users are taking a more cautious attitude toward coal purchases. Considering these points, it is not realistic to suppose that the present price differential between oil and coal will contract and coal prices will rise until they are at the same calorie-equivalent price level as fuel oil. But considering constraints on supply, we can assume there is little chance that the gap between oil and coal prices will grow wider.

2-2 Long Range Prospects (1985-90)

After 1985 it will be possible to expect increased production from new development projects in Australia and Canada, so if there is orderly progress on expansion of loading capacity, a considerable increase in coal supplies can be expected.

Thus a large increase in coal supplies, primarily Australian, can be expected. But even though there are large deposits and mines and loading facilities are built or expanded, there will be a striking concentration of demand on Australian coal and supplying coal will become increasingly risky unless U.S. and PRC coal, which could be imported in large quantities, is in fact developed and imported. In such a situation it would be impossible to satisfy the demand for coal which is expected to come from the power industry.

As for PRC coal, it is quite likely that there will be considerable delay in development of mines and provision of infrastructure, even though there has been financial assistance from Japan. In the case of U.S. coal, it is generally thought that it will be 1990 before railroads, ports and other infrastructure facilities are provided and large quantities of coal can actually be exported to Japan and the Far East.

In short, it can be expected that market conditions for coal will tend to be tight from 1985 on. Table 10 gives three scenarios for coal prices: In case I some productive capacity is expected but there is little chance that prices will be set in a way that benefits the buyer; in case II there is a strong likelihood that prices will be set in a way which benefits the seller. And in case III, even though market conditions will be tight, coal prices are unlikely to reach the calorie-equivalent price of oil.

In other words, if the present price differential between oil and coal is taken as the base and fuel oil prices are increased 10 percent annually for 10 years, the price of coal would have to rise at an annual rate of 17 percent to reach the calorie-equivalent price of fuel oil; it is hardly imaginable that coal prices will consistently rise at a rate higher than that of fuel oil.

Table 10. Coal Price

	.(1) [illegible] [illegible]
(3) 短期見通し '83～'85年	(4) 豪州炭については価格改定分も含めて'84年まですべて契約切れの状態であり、現在'84～'85年度積み出し分の価格改定分についての交渉が進められている状況にある。 したがって'84～'85年度までは、前述のような需給が逼迫した状況が基本的には続き、スポット価格及び短期（2～3年）契約ものの価格は、かなりの上昇が見込まれる。更に、これらの価格は長期価格に反映されるものと思われる。 欧州・東南アジアとの買入れ競合は価格上昇圧力となる。
(8) 中期見通し '87～'90年	(9) IEAの石油火力禁止の圧力がますます強まり、原子力も計画どおり開発が進まないため、石炭に対する需要は一層強まり、他方で豪州炭以外の中国炭、米国西部炭の開発による供給分散が大きく進まない恐れがあるので、価格の軟化は望めない可能性が強い。たとえば、石炭火力の建設が遅れる場合でも、影響は単なる時期的なズレにとどまり、大きな価格軟化要因とはならない。

（出所）：（財）日本エネルギー経済研究所 (25)

Forecasts (Scenarios)

(2) 価格形成要因と前提条件

	(1) 需給バランス (5)	・'85年まで現在のようなタイトな状態が基本的に続き，需給の緩和は期待できない。
	(2) 原油価格上昇によるインフレの影響 (6)	・新規開発ものの生産費・輸送費に反映され，需給バランスからみて，価格転嫁は比較的容易。
	(3) 重油との経済性比較 (7)	・原油価格の上昇により石炭の経済的メリットは継続する。石炭生産者は石炭価格の割安感を抱いており，重油との格差縮少の意図が強く価格への影響は避けられないが，石炭デメリットを考慮した上で重油に対してカロリー等価の水準にはならない。
(10) ケースI（レファレンス）	(1) (11) 需給バランス	・比較的安定…余剰供給力が期待できる。 ・国・業界ベースでの需要とりまとめなどの開発参加態勢が順調に整備される。 ・コール・チェーン（鉄道・港湾・外航船・受入基地を含む）の整備がスムーズに進行する。
	(2) (12) 生産者・資源所有者のプロフィット・マージン拡大	・供給ソースの分散がうまく行なわれる。 ・生産者間の競争が相当程度期待される。
	(3) (13) 原油価格上昇によるインフレの影響	・価格に転嫁される。 ・コストをかなり反映した水準で価格が決まる。
	(4) (14) 重油との経済性比較	・無視できないが直接の要因にはならない。
(15) ケースII（ミドル）	(1) (16) 需給バランス	・比較的安定するが，過剰生産とならないよう需要を確保した上で，生産量が決められる。 ・需要側の足並みが揃わない。 ・コール・チェーンの整備が比較的小規模にとどまる。
	(2) (17) 生産者・資源所有者のプロフィット・マージン拡大	・オイル・メジャーなどの生産者側が資源支配を背景にしてマージンの拡大を図るが，ＯＰＥＣが石油価格を政治的に決めるような力には遠く及ばない。 ・市場の寡占化が進み，生産者側に有利な状態となるが，価格設定を行なうほどの力は持てない。 ・生産者間の競争は確保される。
	(3) (18) 原油価格上昇によるインフレの影響	・需給の力関係から見て価格転嫁は比較的容易。 ・コスト・ベースよりはかなり高い水準で価格が決まる。
	(4) (19) 重油との経済性比較	・生産者側は重油との格差縮少の意図強く，価格に影響するが，カロリー等価にはならない。
(20) ケースIII（ハイ）	(1) (21) 需給バランス	・生産者側は原則として需要側の引取保証を取りつけた上で開発を行ない，余剰供給力にあまり期待できない。 ・石油供給の突発的な中断，ストライキ，コール・チェーンの整備の遅れ，需要と供給のマッチングのズレなどの要因により，一時的な需給タイト現象が繰り返しておこり，価格上昇圧力となる。 ・原子力開発の遅れ，石油依存度低減の必要性から燃料選択の幅が狭まり，需要の価格弾力性はさらに低下する。 ・供給ソースの分散化，需要側の一本化がうまく行なわれずバーゲニング・パワーが発揮できない。
	(2) (22) 生産者・資源所有者のプロフィット・マージン拡大	・総合エネルギー産業を目指すオイル・メジャーなどの生産者側は，豊富な資源支配を背景にかつて石油市場を支配したのと同じように石炭市場の制覇を狙って，マージン拡大の意欲を持っており，石油とのカロリー等価を主張する。 ・生産者カルテルの結成は客観的に見て困難だが，需給の動向によっては暗黙の了解のもとにリーダー企業や政府の行動に追随・同調する動きが起こり，結果的にはカルテル行為を行なったのと同様の成果を収める。
	(3) (23) 原油価格上昇によるインフレの影響	・すべての価格に転嫁されるが，実際の価格はコストベースを遥かに上回るものとなる。
	(4) (24) 重油との経済性比較	・石炭デメリットを考慮した上で，重油に対してカロリー等価の水準まで価格が上昇する。

[Key on following page]

Key:

1. Summary
2. Factors comprising prices and assumed conditions
3. Short range outlook (1980-85)
4. Australian coal, including that which is newly exploited, is sold out through 1984, and commercial talks for the new coal to be shipped in 1984-85 are going on now. Thus market conditions will continue to be tight until 1984 or 1985; spot market prices and the short term (2 or 3 years) contract price will go up a good deal. These prices will also be reflected in long term contract prices. Prices will be pushed up by competition from buyers in Europe and Southeast Asia.
5. (1) Supply and Demand Balance--Present tight market conditions will basically continue until 1985; there is no hope for easing.
6. (2) Inflationary Effects of Crude Oil Price Rises--The effects of inflation will be reflected in the costs of producing and transporting newly exploited coal, and will be easily passed on because of tight market conditions.
7. (3) Economic Advantages in Comparison to Fuel Oil--The economic merits of coal will continue as crude oil prices increase. Coal producers are aware of the relatively low price of coal and wish to reduce the price spread between coal and fuel, so an impact on coal prices is inevitable. But because of the inconvenience of using coal, it will not reach the calorie-equivalent price of fuel oil.
8. Medium range outlook (1987-90)
9. IEA pressure for prohibition of oil fired equipment will grow increasingly strong and--because development of atomic energy will not proceed as planned--market conditions for coal will become tighter yet. Since it is feared there will not be much progress in diversifying supplies to include coal from the PRC and the western U.S., there is little hope for improvement in the balance of supply and demand. If, for example, the construction of coal fired facilities is delayed, impact on demand will also be delayed, but there will be no real easing of demand.
10. Case I (reference)
11. (1) Supply-demand balance--Relatively stable; excess supply can be anticipated. --Participation in development will be coordinated on a countrywide or industrywide basis. --Provision of coal chain facilities (including railroads, ports, ships and receiving bases) will proceed smoothly.
12. (2) Profit margin expansion for producers and resource owners--Sources of supply will be skillfully diversified. --A great deal of competition among producers can be expected.
13. (3) Inflationary effects of crude oil price rises--Costs will be passed through. --Prices will be set at levels which reflect costs to a great extent.
14. (4) Economic advantage in comparison to fuel oil--This cannot be ignored, but it will not be a direct factor.
15. Case II (middle)
16. (1) Supply-demand balance--Relatively stable, but production levels will be set on the basis of demand so there will be no excess production. --Consumers will not be coordinated. --Coal chain facilities will stay small scale.

17. (2) Profit margin expansion for producers and resource owners--Producers including the oil majors will control resources and will try to expand margins, but will fall far short of OPEC's power to set oil prices for political reasons. --Market oligolopy will develop and circumstances will favor the producers, but they will lack the strength to carry out price agreements. --There will be competition among producers.
18. (3) Inflationary effects of crude oil price rises--Market conditions will make cost pass-through relatively easy. --Prices will be set at a highly high level on a cost basis.
19. (4) Economic advantage in comparison to fuel oil--Prices will be affected by the desire of producers to reduce the price differential between coal and oil, but coal will not reach the calorie-equivalent level of fuel oil.
20. Case III (high)
21. (1) Supply-demand balance--Producers will develop coal only on securing transactions with users, and little excess production capacity can be expected. --Temporary market tightness and upward pressure on prices may result from such factors as a sudden cutoff of oil supplies, strikes, delay in setting up the coal chain, and mismatching of supply and demand. --Delayed development of atomic energy and the necessity of reducing dependence on oil will narrow the selection of fuels and reduce price elasticity of demand. --Consumers will be unable to develop bargaining power because they have not diversified sources of supply and are not unified.
22. (2) Profit margin expansion for producers and resource owners--Producers, including oil majors who seek to form a comprehensive energy industry, will control abundant resources and will attempt to gain the same dominance of the coal market as they hold in the oil market; in order to expand profit margins they will call for calorie equivalence of coal and oil prices. --Formation of a producers' cartel will not be objectively evident, but market conditions will give rise to a tendency to tacitly accept and follow the actions of leading industries and governments; the result will be effectively the same as if a cartel had been formed.
23. (3) Inflationary effects of crude oil price rises--All costs will be passed through, but actual prices will be set above the cost basis.
24. (4) Economic advantage in comparison to fuel oil--With consideration given to the inconvenience of using coal, coal prices will be set at the calorie-equivalent level of fuel oil.
25. Source: Japan Energy Economics Institute

Although it is expected that market conditions for coal will be tight and there is little chance of a buyer's market, it is practical and proper to think that coal prices will not rise sharply and consistently to the calorie-equivalent price of fuel oil. The most important task for the concerned parties in the coal importing countries will be to devise the necessary countermeasures so that will not happen.

9601
CSO: 8129/1809

OIL INDUSTRY RELIEF MEASURES APPROVED, SELLING PRICES NOT SET

Tokyo JAPAN PETROLEUM, ENERGY WEEKLY in English Vol 16, No 34, 24 Aug 81 pp 1-3

[Text]

As reported last week, the institution of the controversial government-set standard selling prices, originally scheduled to be decided on July 27 but put off to August 20 in the face of strong opposition from the oil consumer sector, was once again postponed to a later date, probably until September 16, when the next meeting of the Petroleum Council, an advisory body to the Minister of International Trade and Industry on major oil industry matters, is scheduled to be held.

At the August 20 meeting of the Petroleum Council, it was only decided that both the government and industry should take preparatory steps so that Article 15 of the Petroleum Enterprise Law can be invoked at any moment deemed necessary to institute the standard selling prices. The consensus of opinion among the council members was that the final decision as to when and how the standard prices are enforced should be made with extreme care, taking into account:

- the effectiveness of the refinery production cutback started in July under administrative guidance (JPEW, June 29 - P.1),
- the degree of success in industry's efforts toward increasing product prices with effect from early August (JPEW, August 3 - P.7),
- the somewhat erratic movement of the yen exchange rate versus the US dollar in recent weeks (JPEW, August 12 - P.12; August 17 - p.2), and
- the OPEC nations' move on new oil prices and production levels.

Meanwhile, the Petroleum Council at this meeting on August 20, heard an interim report prepared by the council's subcommittee and approved the subcommittee's other recommendations on a number of measures to be taken, both short range and long range, to rescue the deficit-stricken petroleum refining and marketing/primary distribution industry. The subcommittee was organized immediately after the Petroleum Council meeting on July 27 as a task force to work out ways and means to solve the problems now facing the Japanese oil industry. Since its inauguration, the subcommittee has had a series of meeting on July 29, August 3, 4, 12, 14 and 18 to hear the opinions of various organizations including major oil-consuming industries (such as the petrochemical, iron and steel, electric utilities, city gas, fisheries, truck transportation industries).

The subcommittee's recommendations submitted to the August 20 meeting of the council did not strike a fresh note but include, among others (JPEW, August 3 - P.1):

A. Emergency and Short-Range Measures

- **A downward revision of the Petroleum Supply Plan for fiscal 1980 (see separate article in this issue).**
- **Purchase by the governmental Japan National Oil Corp. of surplus crude oil from refiners.**
- **Requesting cooperation from the electric utility industry to shift from crude oil burning to fuel oil C burning.**
- **Requesting cooperation from city banks to provide refiners with the funds necessary to finance cost increases arising from increased stockpilig of oil and reduced rate of refinery operation.**
- **Investigation as to advisability of instituting standard selling prices on LPG to rescue the likewise deficit-ridden LPG industry.**

B. Medium- and Long-Range Measures

- **Improvement of the oil industry structure, which in its present state is susceptible to excessive competition among companies, by:**
    . scrapping down of surplus and inefficient refining facilities so as to lessen the wide gap currently existing between large production capacities and marketing/distribution capacities,

    . consolidation of the existing 13 marketing/primary distribution companies into a smaller number of financially healthier companies, or at least into fewer groups, and

    . joint operation, intra-group or inter-group, in areas such as crude oil purchase and plant & equipment investment.
- Assurance of adequate supply of middle distillate fuels (in the face of the crude oil mix to be imported into Japan in the future becoming increasingly heavier) by encouraging the introduction of residual oil cracking and/or alternative energy sources.

- **Realization of normal product prices through market-oriented pricing mechanism** so that the sluggish demand for fuel oil C (triggered by the industrial sector's stepped-up energy conservation and alternative energy development), the continued firm demand for gasoline and middle distillate fuels, etc. can be duly reflected on the prices of these products.

- **Studies on measures to counter the current financial risks resulting from foreign exchange rate fluctuations** in view of the fact that the impact of such fluctuations is being focused on the refining industry with the oil import bill now accounting for nearly one half of the nation's total imports. Because of a number of technical problems involved in such studies, a specialist working group will be organized within the subcommittee. The working group is expected to finalize its studies by the end of October.

CSO: 4120/328

PANEL URGES DIVERSIFYING OF FOREIGN COAL IMPORT SOURCES

Tokyo JAPAN PETROLEUM, ENERGY WEEKLY in English Vol 16, No 35, 31 Aug 81 pp 1-6, 10

[Text]

Following a seven-month investigation into the problems involving in securing long-term coal supply stability from overseas sources, the Overseas Coal Investigative Committee* (headed by Masao Sakisaka, board chairman of the Institute of Energy Economics), a privately organized advisory panel to Director-General Kunio Komatsu of the Natural Resources & Energy Agency of the Ministry of International Trade and Industry (MITI), presented its interim recommendations on August 26, calling for, among others, the diversification of coal import sources from Australia, on which Japan is heavily dependent, to other areas such as the western U.S., expanded utilization of lower grades of coal such as brown coal, as well as enhanced international cooperation between coal producing and importing nations.

The report is based on the assumption that demand for coal resources from foreign sources will continue to grow through this decade. According to the latest available "Alternative Energy Supply Targets for 1990," as adopted at a cabinet meeting held on November 28, 1980, and published on the same date by MITI (JPEW, December 1, 1980 - PP.1/6), Japan's coal import in fiscal 1990 is forecast to be 143.5 milion tons** (53.5 million tons of steam coal and 90.0 million tons of coking coal) in contrast to actual imports in fiscal 1980 (ended March 31, 1981) of 73.0 million tons (7.2 million tons of steam coal, 64.7 million tons of coking coal and 1.1 million tons of anthracite), representing an increase of nearly 100 percent over the next ten-year period.

On the other hand, certain problems involved in securing this required import are envisioned: namely, the inability of the supplier nations to keep pace in terms of their coal shipment facilities, the sharply increased

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(*) Composed of representatives of coal suppliers, coal-consuming industries, trading houses, and banks.

(**) In addition to this import, indigenous coal supply is estimated to total 20 million tons steam coal and coking coal on a 50:50 basis.

coal prices triggered by ever growing demand (especially in the case of Australian coal), etc.

The contents of the Committee's report are summarized as follows:

A. Four Points of Major Consideration

(1) The "coal chain" must be viewed from an overall angle, with measures taken to assure the smooth operation of each phase of the entire chain system.

(2) In view of long lead times required for establishment of such a system, adequate planning should be undertaken and hasty decisions avoided at all cost.

(3) Planning should be carried out with due consideration given both to achieving supply security (to minimize the impact from suspension in supplies by strikes in the supplier nations and the like) as well as to securing the economic feasibility of projects involved.

(4) In order to make long-term planning successful, international cooperation of a bilateral and multi-national scale must transcend the immediate issues of coal procurement and extend into areas of mutual interest.

B. Directions and Problems Related to Supply Stability

(1) Expansion of supply capabilities

The world demand for coal is forecast to double over the next ten years, thereby requiring efforts to create the supply structure necessary to meet this demand. Japan's demand is expected to be met through fiscal 1985; however, by 1990, supply is anticipated to fall short of demand, particularly in the area of steam coal. In this connection, major oil companies' active entry in recent years in coal resources development is expected to have a considerable influence on the world coal trade and their future moves deserve close attention.

- Acceleration of mine development

  Expansive projects aimed at mine development must be given thorough consideration, including capital participation where deemed advantageous to the securing of longer-term coal supplies.

- Expansion of loading capability

  Since grave apprehension is felt that the coal-producing nations' infrastructure relating to coal transport and loading facilities will become aggravated over the coming years, Japan must take cooperative steps with the nations involved to build the facilities needed.

(2) Diversification of supply sources

- Regional diversification

At present Japan relies on Australia for approximately 60 percent of its steam coal imports, and nearly 40 percent of its coking coal imports. In view of the potential danger inherent to this overdependence on a single country, say, in the cases of mine strike and accidents related to coal mines, utmost efforts should be taken to achieve greater diversification in coal supplier nations.

i) Western U. S.

Recently, attention has been focused on vast proven coal reserves located in the western U. S., estimated to be about one half of the U. S.'s total reserves. Japan should cooperate with the U. S. in aiding the development of this vital area, and in providing assistance to improve the currently inadequate transport and port facilities as well as those needed in the future. Japanese specialists should be called upon to cooperate in the selection of specific mining sites and the mapping of transport routes in order to improve the infrastructure expeditiously.

ii) Expansion of current supply sources

In view of overall superior position within the coal supply picture, Australia should continue to be looked upon as a highly important coal supply source. China, Canada and other existing suppliers should also be fully explored as to their potential expansion capabilities.

- Diversification of coal grades

At present, lower-grade coal is virtually excluded from consideration on world markets, yet their proven reserves are said to be as high as 30 percent of the total known world coal resources. For this reason, technologies should be pursued which will allow greater utilization of these available but yet largely untapped energy sources.

(3) Improvement of domestic infrastructure for importing foreign coal

To meet the anticipated growth in coal import supplies, the availability of the required number of oceangoing vessels and long-term chartering contracts must be given full attention. Consideration must also be paid to the need for "coal centers" which serve as import relay stations. In addition, necessary tonnage of coastal barges must be secured for secondary shipping from coal centers to individual coal-consuming areas.

(4) Improvement and diversification of coal utilization technologies

In order to meet Japan's coal needs, the following coal technologies are seen to be of urgent importance and should become the focus of R&D efforts:

- In the short term: technologies relating to flue gas treatment and ash disposal to cope with increased coal burning to be promoted to supplement the current crude oil burning.

- In the long range: technologies relating to coal-oil mix fuel, fluidized bed combustion, utilization of lower-grade coal, liquefaction and gasification of coal, etc.

- Attention should also be given to the development of improved production technologies to be applied in the respective coal-production nations.

C. Governmental/Private Response

(1) Cooperation from the private sector

To create a rational and stable supply system in tune with the coal market needs, private cooperation should be sought relative to the following points:

- Owing to the fact that the coal mine development is implemented only when a definite demand has been established for the ultimate coal supply, long-term contracts within the private sector should be sought which would ensure such demand.

- Cooperation necessary for building overseas infrastructures

  Full cooperation as needed must be given by Japanese coal users and demand industries for the development of the infrastructure in the coal-supplying nations.

- Cooperation for a rational market configuration

  Sharp price rises for foreign coal serve to impede trade expansion between the producing and importing nations, as well as the attainment of lower oil dependence as internationally demanded. A rationalization of the importing market should therefore be carried out to reach a purchasing structure offering greater order for improved security.

- Cooperation for greater international understanding

  In order for Japan to play a more meaningful role in related issues of world concern, Japanese parties concerned should reach mutual agreement on philosophies and measures which can then be presented at international forums.

(2) Government policies

While private cooperation is naturally vital to the attainment of sound resolutions to coal-related issues, the role the government must play must also be stressed in areas such as where high risks are involved, where infrastructures must be improved to facilitate private coal industry activities, and where international adjustments will be necessary. Steps should be taken in the following directions:

- Enhanced information networks

  The government should improve its ability to gather, analyze and put to good use a broad range of knowledge relating to domestic and overseas energy issues, international politics, economies, etc.

- Enhanced international cooperation

  In addition to actively seeking improved international cooperation both on a binational and multi-national level, the government should also do its utmost to offer aid and cooperation to developing countries possessing energy resources.

- Government policies relating to the infrastructures

  . Promotion of infrastructural development in coal-producing nations.
  . Construction of coal centers based on low-interest funding.
  . Assistance in promoting coal utilization technologies and development.
  . Promotion of mine exploration and development activities.

Shown on pages 6 and 10 are the related tables.

Table 1 World Coal Reserves, Production and Trade (1979)

(Unit: million metric tons)

Country	Reserves*	Production	Exports	Imports
Australia	36,302	83	40.3	-
Canada	4,368	28	13.9	17.6
China	99,000	663	N.A.**	-
France	574	19	0.5	27.4
India	13,134	103	N.A.	N.A.
Italy	15	0	-	13.9
Japan	1,056	18	-	58.6
Poland	30,600	201	41.3	0.9
South Africa	25,290	103	23.4	-
UK	45,000	121	2.3	4.4
USA	190,890	704	59.9	1.9
USSR	165,470	495	23.9	9.5
West Germany	34,536	93	15.6	7.8
Others	41,255	148	7.9	87.0
	687,490	2,779	229.0	229.0

(*) Include brown coal. (**) China's export to Japan was 1.38 million tons.

Source: Reserves -- "The 11th World Energy Conference (1980)"; Production -- "Coal International" (1980); Trade -- "World Coal" (1980)

Table 2 Japan's Imports of Overseas Coal by Source

(1,000 metric tons)	Fiscal 1974	Fiscal 1975	Fiscal 1976	Fiscal 1977	Fiscal 1978	Fiscal 1979	Fiscal 1980
Steam Coal							
Australia	70	169	248	528	727	1,282	4,517
Canada	-	-	-	-	12	-	600
China	69	135	125	168	172	236	742
South Africa	-	-	15	6	20	29	487
USA	12	48	-	-	28	-	639
USSR	87	31	211	237	123	129	249
Others	-	-	4	-	-	1	-
	238	383	603	939	1,082	1,677	7,234
Coking Coal							
Australia	23,210	22,720	26,238	26,013	24,159	26,981	26,493
Canada	9,429	11,434	10,095	10,611	10,917	9,776	11,214
China	4	4	16	3	427	847	955
Poland	1,283	1,015	986	740	429	489	387
South Africa	133	69	1,210	2,398	2,298	2,453	2,861
USA	25,552	21,412	17,088	13,305	9,946	13,955	20,671
USSR	3,058	3,184	2,964	2,863	2,246	1,926	2,003
Others	264	1,125	592	347	398	262	114
	62,933	60,963	59,189	56,280	50,820	56,689	64,698
Anthracite	1,456	1,040	1,094	1,441	1,001	1,071	1,140
Total	64,627	62,386	60,886	58,660	52,903	59,437	73,072

(Source: Ministry of Finance)

Table 3 Japan's Steam Coal Import Prices (CIF Basis)

(US$/ton)	Fiscal 1974	Fiscal 1975	Fiscal 1976	Fiscal 1977	Fiscal 1978	Fiscal 1979	Fiscal 1980
Australia	39.8	39.1	38.5	37.0	39.5	44.0	56.8
Canada	-	-	-	-	31.4	-	53.8
China	34.1	32.0	34.0	38.3	37.1	37.7	49.5
South Africa	-	-	29.7	32.7	35.9	41.6	42.5
USA	44.3	40.4	-	-	42.7	-	66.3
USSR	26.9	28.6	28.1	28.6	29.7	35.0	46.0
Others	-	-	32.5	-	-	-	N.A.
Average	33.6	35.8	33.7	35.1	37.9	42.4	56.7

(Source: Ministry of Finance)

CSO: 4120/329

TDA COMMISSIONS IHI TO REPAIR A300 ENGINES

Tokyo JPE AVIATION REPORT-WEEKLY in English No 536, 2 Sep 81 p 2

[Text]

Toa Domestic Airlines (TDA) has appointed Ishikawajima-Harima Heavy Industries Co. (IHI) for overhaul of its General Electric CF6-50 engines for Airbus Industrie A300 transports. IHI has already invested ¥1,000 million in equipment for overhaul of CF6 engines for Boeing 747s of All Nippon Airways, which will be used for the A300 engines as well.

TDA has contracted with Airbus Industrie to purchase nine A300s, of which it has already acquired three. The fourth A300 will be delivered to it in November and the fifth and sixth aircraft in 1982.

The A300 is equipped with two CF6-50 engines. The overhaul of the 3,960-kilogram engine is estimated to cost more than ¥30 million per unit on every occasion.

CSO: 4120/326

ADVISORY COUNCIL SUPPORT PRIVATE TAKEOVER OF NAMCO

Tokyo JPE AVIATION REPORT-WEEKLY in English No 536, 2 Sep 81 pp 2-4

[Text]

The Aircraft and Machinery Industry Council, an advisory body to the Ministry of International Trade and Industry (MITI), has recommended the private sector's takeover of the semigovernmental Nihon Aeroplane Mfg. Co.'s (NAMCO) business and the establishment of new corporations for the Japan-Boeing-Italy Boeing 767 program and the Rolls-Royce/Japan RJ500 aircraft engine program.

The recommendation, prepared by the Policy Subcommittee of the council's Aircraft Industry Committee, was approved at the committee's meeting in the middle of August.

It gave support behind the government's decision to disband NAMCO, with the private sector taking over its current business of product support for YS-11 operators, by the end of FY 1982 or March 1983. But it noted that due consideration should be given to the YS-11 product support and to the future of the 120 NAMCO employees after the takeover.

Informed sources said Mitsubishi Heavy Industries Ltd. (MHI) alone may take over the NAMCO business, although the private sector has so far considered a joint company of MHI, Kawasaki Heavy Industries Ltd. (KHI) and Fuji Heavy Industries Ltd. (FHI) for the takeover. The committee prefers, however, that a single company succeed to the NAMCO business, they added.

NAMCO was founded in 1959 with 54 percent of its capital raised by the government to develop, produce and market the YS-11, Japan's first self-developed commercial aircraft. It has sold 180 aircraft at home and abroad. But it has been faced with a sharp increase in production cost, which has brought about a cumulative business loss bigger than its capital. Since discontinuing of YS-11 production in FY 1973, NAMCO has been supplying YS-11 spare parts and technical service for YS-11 operators and recalling deferred payment credits.

But the government decided late last year to disband NAMCO, as part of its administrative reform efforts, requesting the advisory council to study the advisability of the decision. The YS-11 product support business, to be taken over by the private sector, is still important because 160 YS-11s are still flying in the world.

On development and production of aircraft and engines, the recommendation confirmed MITI's basic policy of supporting only the development stages of projects involving great risks. It said the private sector should be wholly responsible for production and marketing.

The basic policy is reflected in the proposal for the establishment of a new corporation to take over Civil Transport Development Corp.'s (CTDC) B-767 program contract with Boeing with completion of the B-767 program's development phase next year. CTDC has handled the development phase with government loans, which will not be available for production and marketing phases. The new corporation will be founded jointly by MHI, KHI and FHI. The B-767 program will shift to the production phase when a type certificate is given to the new aircraft in the summer of 1982.

On the development of the Y-XX 150-seat-class transport, the recommendation said the government and the industry should consider CTDC or a new incorporated foundation to undertake the development with government loans. At present, CTDC has a Y-XX preparation office to handle basic design work under the FY 1981 budget, although foreign partners in the program have yet to be selected. But MITI has not yet decided whether CTDC should continue to take charge of the Y-XX development, considering that CTDC, which has handled the B-767 program with Boeing, would not be appropriate as a Y-XX promoter if foreign aircraft manufacturers other than Boeing are selected as partners.

Complying with the recommendation, MITI and the aircraft industry will study an appropriate Y-XX promoter while going ahead with work on selection of partners. If a new corporation is founded for the Y-XX program, a precedent of setting up a new corporation for each government-subsidized aircraft development project would be established.

For engine projects, the recommendation said new organizations should be established separately from aircraft programs. This policy would be favorable to engine manufacturers. If the same organization undertakes aircraft and engine development, it would be difficult for it to sell engines to competitive aircraft manufacturers.

In this respect, the recommendation said a new nonprofit organization should be founded for the Japan/Rolls-Royce RJ500 (XJB) program before full-scale development starts. At present, the Engineering Research Association for Aerojet Engines (ERAAE), which undertakes aircraft engine programs for MITI's Agency of Industrial Science and Technology, has an XJB office through which Ishikawajima-Harima Heavy Industries Co., MHI and KHI have set up a joint venture with the British partner in April 1980 to launch work on the RJ500 engine. The new Japanese organization for the RJ500 program will be formed by the three engine manufacturers.

The biggest problem with the RJ500 program is how to minimize financial risks in the production phase. But the recommendation supported MITI's policy of not subsidizing the production phase, calling on the three engine manufacturers to make even greater efforts to solve problems themselves. The RJ500 is planned to enter service in 1986 to power next-generation 150-seater airliners.

CSO: 4120/326

JDA TO NAME MT-X PRIME CONTRACTOR

Tokyo JPE AVIATION REPORT-WEEKLY in English No 536, 2 Sep 81 pp 8-9

[Text]

The Japanese Defense Agency (JDA) is expected to make a final decision on a prime contractor for the development and production of the MT-X new intermediate trainer by Sept. 15.

The JDA's Technical R&D Institute (TR&DI) is now coordinating views with the Air Self-Defense Force as the MT-X operator and JDA internal bureaus after evaluation of MT-X proposals by MHI, KHI and FHI vying for the ¥300,000 million prime contract. It may select the prime contractor tentatively by the end of August before the JDA's final decision.

Informed sources said KHI may be awarded the prime contract on the condition that the other two would take part in the program as subcontractors. In actuality, the three contenders would jointly undertake the program, they added.

The prime and subordinate contractors, if named in September, will start the MT-X program with work on a basic airframe design in October under the FY 1981 budget's ¥1,955 million for the work.

According to the TR&DI's plan, work on a detailed design will be funded in FY 1982 and fabrication of test aircraft in FY 1983. Funding is estimated at ¥5,000 million for FY 1982 and more than ¥30,000 million for FY 1983. Thus, MT-X development funds would total ¥37,000 million.

In the development phase ending in FY 1987, the TR&DI plans to fabricate six prototype aircraft -- four for flight tests and two for fatigue tests. The first prototype aircraft is scheduled to make its first flight in the summer of 1985 before delivery to the TR&DI by the end of the year. The other three flight test aircraft will be delivered by March 1986. They will undergo technical tests in FY 1986 and application tests in FY 1987.

The MT-X will replace the FHI-developed T-1 and the Lockheed T-33, produced by KHI under license. MT-X procurement is expected to total about 200 aircraft.

CSO: 4120/316

JET ENGINE FOR DRONE TO BE DEVELOPED

Tokyo JPE AVIATION REPORT-WEEKLY in English No 536 2 Sep 81 pp 9-10

[Text]

The TR&DI of the Japanese Defense Agency has decided to start the development of a jet engine in FY 1982 for a new remotely piloted vehicle as a target drone, although it had intended to launch the development of both the engine and the airframe in the same year.

It has introduced the Firebee target drone through domestic production for missile firing training. But the Firebee's J-69 engine has been imported from Teledyne. As to the future target drone, the TR&DI intends to develop both the engine and the airframe on its own.

Although the high-cost Firebee has been used repeatedly, the TR&DI will design the new drone as a disposable aircraft whose price will be one third of the Firebee price. Therefore, the engine cost would have to be lowered sharply.

The TR&DI has already been developing a small jet engine jointly with MHI since FY 1980 for a new ground-launched antiship missile based on the ASM-1 air-launched antiship missile using a solid fuel rocket. MHI has completed prototypes for tests. The engine for the new drone is required to be less costly than the missile engine.

KHI has submitted a proposal on the development of the drone engine to the TR&DI, competing with MHI which has experienced the missile engine development.

CSO: 4120/326

SJAC SPACE INDUSTRY REPORT FOR FY 1979

Tokyo JPE AVIATION REPORT-WEEKLY in English No 536, 2 Sep 81 p 10

[Text]

The Society of Japanese Aerospace Companies (SJAC) revealed toward the end of August its report on Japanese space industry for FY 1979. Space related major Japanese manufacturers number 70 and the total turnover for that fiscal year amounted to ¥103,200 million. Of the total sum, 21.4 percent amounting to ¥22,100 million was for export mainly related with ground equipment such as data transmitting/receiving and processing systems. Import amounted to ¥25,300 million.

Of the ¥103,200 million, ¥34,000 million is related with the rocket, ¥32,800 million with the ground equipment and ¥16,000 million with the artificial satellite. About 70 percent of the domestic business which accounted for 78.6 percent of the total sum is related with the work ordered by the National Space Development Agency of Japan.

Of the 70 manufacturers, 32 are in the electronic and electric business, seven are precision equipment makers, five chemical firms and three machinery makers.

Personnel in the space manufacturing industry number approximately 4,700. Forty-five percent of these people are research and development engineers.

CSO: 4120/326

MITI MOVES TOWARD REORGANIZATION OF OIL INDUSTRY

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16, No 36, 7 Sep 81 pp 1-3

[Text]

The Ministry of International Trade and Industry (MITI) is taking a big step forward in the controversial reorganization of the downstream of the Japanese oil industry, with special emphasis placed on consolidating wholly Japanese-owned refining and marketing/primary distribution companies into three or so groups. According to an unofficial MITI plan, Idemitsu Kosan, Kyodo Oil, and Maruzen Oil/Daikyo Oil will constitute the nucleus companies in the reorganization of the Japanese independent oil companies.

As the first of a series of actions to be taken by MITI to implement this objective, the long-term government bank loans at low interest rate in the form of Japan Development Bank loans, which so far had been limited to the Kyodo Oil group companies, will also be extended to other wholly Japanese-owned companies to help them finance their facility expansion.

A total amount of ¥12.0 billion ($52 million) JDB loans was appropriated in the budget for fiscal 1981 (ending March 1982) to be extended to the Kyodo Oil group companies. MITI is now planning to request the Finance Ministry to approve JDB loans totaling ¥15.5 billion for fiscal 1982, which will be extended to all of the Japanese independents to provide an incentive for stepping up the reorganization.

Kyodo Oil was established on August 10, 1965, under administrative guidance of MITI, integrating the marketing divisions of then small-sized independents -- Nippon Mining, Asia Oil and Toa Oil. Later, Fuji Oil and Kashima Oil joined the Kyodo group in 1966 and 1967, respectively. In 1970 and 1973, Asia Kyoseki and Toa Kyoseki were established by Asia Oil and Kyodo Oil and by Toa Oil and Kyodo Oil, respectively, Kyodo Oil holding a one-third equity interest of each.

However, Toa Oil was separated from the Kyodo Oil group, when Showa Oil acquired 25 percent out of 38.85 percent of Toa Oil's equity capital owned by C. Itoh & Co. effective December 25, 1979, with the remaining 13.85 percent still owned by C. Itoh. Likewise, Asia Oil left the Kyodo group in February 1981, when Daikyo Oil acquired a 48.7 percent equity share of Asia Oil.

Among the reasons for MITI's move referred to above are:

- Kyodo Oil group companies have already grown up, with their shares of the Japanese market and refining capacity now reaching 13 and 15 percent, respectively, thereby diminishing the reason for the government giving preferential treatment to the Kyodo Oil group companies alone.
- Reorganization of the oil industry, including grouping of oil companies, should be an essential prerequisite to:
    - . avoidance of excessive competition among companies, and
    - . scrapping of surplus refining capacities which led to the over-supply of the products.

  which together are responsible for bringing about the present-day market depression.

Meanwhile, the Petroleum Council's subcommittee is expected to finalize ways and means to improve the oil industry structure by the end of this year (JPEW, August 24 - p.1).

Shown below is a breakdown of the existing 36 refining and marketing/primary distribution companies competing with each other: (For company-by-company details, see the table on the next page.)

	Wholly Foreign-Owned, or Affiliated with Foreign Oil Companies	Wholly Japanese-Owned Oil Companies
A. Refining & marketing/primary distribution companies:		
	General Sekiyu	Daikyo Oil
	Mitsubishi Oil	Idemitsu Kosan
	Nippon Oil	Kyushu Oil
	Showa Oil	Maruzen Oil
B. Marketing/primary distribution companies:		
	Esso Standard Sekiyu	Kyodo Oil
	Kygnus Sekiyu	
	Mobil Sekiyu	
	Shell Sekiyu	
C. Refining companies:		
	Koa Oil	Asia Oil

PRESENT STATUS OF 36 JAPANESE REFINING & MARKETING/PRIMARY DISTRIBUTION COMPANIES

	Capitalization (¥ million) (as of Mar.31, 1981)	Refining Capacity (as of Dec.31, 1980)		Sales Volume in Fiscal 1979	
		BPSD	% Share	1,000 B/D	% Share
A. Oil Companies, Wholly Owned by Foreign Capital or Affiliated with Foreign Oil Companies					
a. 100% owned by foreign capital:					
. Esso Standard Sekiyu	20,000	-	-	202.1	4.88
. Mobil Sekiyu	11,000	-	-	247.6	5.97
. Shell Sekiyu	6,904	-	-	288.4	6.96
	37,904	-	-	738.1	17.81
b. 50% owned by foreign capital:					
. Koa Oil (Caltex)	6,000	229,000	3.86	11.9	0.29
. Kyokuto (Mobil)	7,000	150,000	2.53	-	-
. Mitsubishi (Getty)	15,000	375,000	6.31	319.9	7.72
. Nippon Petroleum Refining (Caltex)	10,000	580,000	9.76	-	-
. Showa Oil (Shell)	6,750	192,000	3.23	182.2	4.39
. Toa Nenryo (equally by Exxon & Mobil)	22,264	430,500	7.25	-	-
	67,014	1,956,500	32.94	514.0	12.40
c. Less than 50% owned by foreign capital:					
. General Sekiyu (49% owned by Exxon)	4,699	175,000	2.95	159.6	3.85
. Seibu Oil (20% by Shell)	8,000	190,000	3.20	23.1	0.56
. Showa Yokkaichi (25% by Shell)	4,000	310,000	5.22	-	-
	16,699	675,000	11.37	182.7	4.41
d. Either indirectly owned by or teamed up with foreign oil companies:					
. Kygnus Sekiyu	2,000	-	-	48.5	1.17
. Nansei Sekiyu	7,625	80,000	1.35	-	-
. Nichimo Sekiyu Seisei	1,000	100,000	1.68	-	-
. Nihonkai Oil	4,000	60,000	1.01	-	-
. Nippon Oil	33,515	26,000	0.44	735.6	17.74
. Toa Oil	4,961	100,000	1.68	-	-
. Tohoku Oil	7,500	100,000	1.68	-	-
	60,601	466,000	7.84	784.1	18.91
Subtotal	182,218	3,097,500	52.15	2,218.9	53.53
B. Wholly Japanese-Owned Oil Companies					
. Asia Kyoseki	9,600	150,000	2.53	-	-
. Asia Oil	7,507	125,000	2.10	1.4	0.03
. Chita Oil	6,000	100,000	1.68	2.4	0.06
. Daikyo Oil	6,737	215,000	3.62	217.6	5.25
. Fuji Kosan	3,989	77,600	1.31	45.0	1.09
. Fuji Oil	10,000	210,000	3.54	31.2	0.75
. Idemitsu Kosan	1,000	760,000	12.79	605.9	14.62
. Kashima Oil	20,000	180,000	3.03	-	-
. Kyodo Oil	18,000	-	-	533.4	12.87
. Kyushu Oil	6,300	170,000	2.86	84.7	2.04
. Maruzen Oil	20,469	392,500	6.61	332.8	8.03
. Nippon Mining	24,600	249,350	4.20	1.9	0.04
. Nippon Seiro	1,120	-	-	2.0	0.05
. Okinawa Sekiyu Seisei	1,830	100,000	1.68	-	-
. Taiyo Oil	400	69,000	1.16	46.6	1.12
. Teiseki Topping	25	4,410	0.07	-	-
. Toho Oil	1,500	40,000	0.67	21.6	0.52
Subtotal	139,077	2,842,860	47.85	1,926.5	46.47
INDUSTRY TOTAL	321,295	5,940,360	100.00	4,145.4	100.00

CSO: 4120/2

MITI LIKELY TO SUPPORT MITSUI PULLOUT FROM IJPC

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16, No 36, 7 Sep 81 p 4

[Text]

International Trade and Industry Minister Rokusuke Tanaka revealed at a September 1 press conference that the Ministry was likely to respect the decision of the Mitsui Group to withdraw from the joint-venture Iran-Japan Petrochemical Co. (IJPC), in the event that a decision in this direction is made by Mitsui. Speculation is rife that the Mitsui Group is contemplating pulling out of the seemingly hopeless project -- construction of which was begun in Bandar Khomeini in southern Iran in 1973 and which is presently in a state of suspension after being 85 percent completed -- in view of the worsening political instability in Iran following the violent deaths of Iranian President Mohammad Ali Rajai and Prime Minister Mohammad Javad Bahonar on August 30.

Mitsui has been contemplating withdrawal from the joint project ever since the outbreak of political unrest in Iran in 1979. The situation was further aggravated by the eruption of the Iran-Iraq War, which resulted in heavy damages to the petrochemical complex. Owing to the continuing disruptions and damages inflicted, the cost of the project has proceeded to spiral, far exceeding original estimations.

By the time immediately preceding the Iran-Iraq War, an estimated total capital investment for the whole project had reached ¥730 billion ($3.2 billion), sharply inflated from the previous estimate of ¥550 billion. The ¥730 billion capital investment was to be shared by Japan (¥430 billion, including ¥20 billion committed by the governmental Overseas Economic Cooperation Fund) and Iran (¥300 billion) (JPEW, November 3, 1980 - p.9). As of April 1981, Japanese private funds for the project were suspended, despite Iranian requests for continued assistance (JPEW, April 27 - p.12).

In addition to the escalation in internal tensions in Iran, other factors are seen to be influencing Mitsui's reluctance to continue participation. On the one hand, as Japanese consumer demand for petroleum has continued to decline the immediate need for Iranian oil has attenuated.

Furthermore, as of February 1982 repayment of capital principal is scheduled to begin. Both Mitsui and MITI are therefore pressed to come to a decision on the project as expeditiously as possible.

At present, Mitsui is awaiting the Iranian response to its capital funding proposal for completing construction at the complex. To date, however, no follow-up action has been taken by Iran, and a promised Iranian delegation to Japan has yet to materialize. The possibility is thus seen to be growing that Mitsui will take this Iranian attitude as further reason to pull out of the project.

Preparing for such an eventuality, MITI Minister Tanaka announced that, in the event of a Mitsui decision to withdraw from IJPC, MITI would give full consideration to the award of export insurance, the amount of which is estimated to be in excess of ¥100 billion ($435 million). This readiness on MITI's part is widely interpreted as a sign of the Ministry's approval of Mitsui's withdrawal from the project itself, and also as an indication of the Japanese government's withdrawal as well.

CSO: 4120/2

SCIENCE AND TECHNOLOGY

FIRMS RATE HAZARDOUS COUNTRIES FOR INVESTMENT PURPOSES

Tokyo JAPAN PETROLEUM & ENERGY WEEKLY in English Vol 16, No 36, 7 Sep 81 p 5

[Text]

The Nihon Keizai Shimbun recently published a survey of 100 leading Japanese companies in which each respondent was asked to evaluate 76 given nations in terms of risks involved when engaging in overseas investments and major trade contracts. As in a similar survey conducted in 1980, the United States came out on top as the least risky nation with which to do business, with a rating of 8.99 out of a possible 10. Nations posing the greatest risks were Afghanistan, Iran, Lebanon and Ethiopia.

Three main factors were taken into consideration in making these evaluations: stability of government, capability to service external debts, and stability of currencies. Of the 100 companies surveyed, 26 had suffered a total of 39 cases of damage in the year ended last July 30. Iran topped the list of the notorious with a total of 14 cases. The most common damage involved non-payment for export deals, unilateral discontinuation of plant construction projects, and cancellation of export contracts. Those companies most severely affected were trading houses, banks and industrial plant makers.

The complete ranking list is presented below:

Rank				Rank			
1981	1980	Country	Points	1981	1980	Country	Points
1	1	[illegible] States	8.99	39	46	Chile	4.68
2	2	[illegible]rmany	8.68	40	44	Hungary	4.66
3	3	[illegible]land	8.34	40	36	Nigeria	4.64
4	4	Canada	8.30	42	41	Czechoslovakia	4.62
5	5	Netherlands	7.84	43	48	Algeria	4.59
6	6	Australia	7.81	44	41	Panama	4.58
7	6	Belgium	7.67	45	39	Argentina	4.48
8	9	Britain	7.49	46	43	Ecuador	4.32
9	8	France	7.36	47	50	Egypt	4.28
10	14	New Zealand	7.33	48	47	India	4.27
11	10	Singapore	7.30	49	49	Romania	4.23
12	11	Sweden	7.24	50	-	Sri Lanka	4.15
13	13	Norway	7.21	51	52	Peru	4.08
14	12	Austria	7.08	52	54	Libya	3.92
15	17	Denmark	6.96	52	55	Kenya	3.92

16	16	Hong Kong	6.76	54	51	Israel	3.90
17	19	Malaysia	6.26	55	53	Ivory Coast	3.80
18	21	Saudi Arabia	6.14	56	45	Iraq	3.68
19	22	Taiwan	6.07	57	57	Burma	3.61
20	20	Ireland	6.06	58	61	Liberia	3.57
21	25	Kuwait	5.99	59	58	Pakistan	3.36
22	22	Spain	5.96	60	56	Bolivia	3.10
23	18	Mexico	5.95	61	65	Mozambique	3.08
24	29	Italy	5.88	62	59	Syria	3.06
25	26	Venezuela	5.67	63	63	Ghana	3.05
26	15	United Arab Emirates	5.62	64	-	Poland	3.03
27	31	Indonesia	5.61	65	66	Sudan	2.88
28	27	Greece	5.55	66	62	Bangladesh	2.85
29	32	South Korea	5.54	67	73	Cambodia	2.73
30	27	Soviet Union	5.44	67	69	Turkey	2.73
31	37	Portugal	5.29	67	70	Congo	2.73
32	35	Thailand	5.25	70	68	Vietnam	2.67
33	30	Brazil	5.23	71	72	Zaire	2.60
34	40	South Africa	5.21	72	67	North Korea	2.57
35	32	China	5.05	73	70	Ethiopia	2.39
36	24	Philippines	5.01	74	64	Lebanon	2.33
37	34	East Germany	4.97	75	73	Iran	2.19
38	38	Colombia	4.[illegible]1	76	75	Afghanistan	1.78

CSO: 4120/2

SCIENCE AND TECHNOLOGY

KAWASAKI PICKED AS MT-X PRIME CONTRACTOR

Tokyo JPE AVIATION REPORT-WEEKLY in English No 537, 9 Sep 81 p 9

[Text]

The JDA has decided to award Kawasaki Heavy Industries Ltd. (KHI) a ¥300,000 million prime contract for the development and production of the MT-X next-generation intermediate trainer for the ASDF. But it intends to let two other competitors, Mitsubishi Heavy Industries Ltd. (MHI) and Fuji Heavy Industries Ltd. (FHI), to have almost equal shares with the prime contractor in the production, in order to secure a balanced development of the three major aircraft manufacturers.

Although a prime contractor usually has an absolute superiority over subcontractors, the JDA plans to shrink their gap in regard to the MT-X contract in consideration of the Ministry of International Trade and Industry's policy of promoting the whole Japanese aircraft industry.

The MT-X will replace the T-1 developed by FHI and the T-33 produced by KHI under license of Lockheed Corp. Its maximum speed will be Mach 0.9 and its take-off distance will be 610 meters. The JDA is expected to obtain 200 to 250 aircraft.

KHI and FHI had been expected to compete for the MT-X contract. But MHI, which has experienced the development of the T-2 advanced trainer, joined their competition. Originally, MHI had been seen as the most promising candidate for the MT-X prime contractor because of its technological superiority. Eventually, however, KHI has won in the three-way competition.

CSO: 4120/3

SCIENCE AND TECHNOLOGY

MITI DEMANDS ¥1,502 MILLION FOR Y-XX PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English No 537, 9 Sep 81 pp 9-10

[Text]

The Ministry of International Trade and Industry (MITI) has earmarked ¥1,502 million in its FY 1982 budget request for the development of the Y-XX 150-seat-class commercial transport starting in the current fiscal year. The FY 1981 budget has set aside ¥353 million for the Y-XX program.

With the MITI budget request in mind, the Japanese aircraft industry may call a top-level meeting in September to determine how to proceed with selection of a foreign partner in the Y-XX program after the McDonnell Douglas Corp./Fokker group and Boeing Co. proposed to the Japanese in August to take part in development of specific aircraft corresponding to the Y-XX. Prior to the top-level session, working-level representatives of Civil Transport Development Corp., Mitsubishi Heavy Industries Ltd., Kawasaki Heavy Industries Ltd., and Fuji Heavy Industries Ltd. may meet to exchange views on the McDonnell Douglas/Fokker MDF-100 and the Boeing 7-7 proposals.

Although industry sources term both of the proposals basically acceptable, the industry will consider which is more feasible and more favorable to the Japanese.

The MITI budget request also calls for ¥403 million (¥2,043 million in FY 1981) for the Japan-Boeing-Italy Boeing 767 (Y-X) program and ¥5,402 million (¥4,722 million) for the Japan/Rolls-Royce development of the RJ500 (XJB) aero engine featuring low noise, low pollution and enhanced fuel efficiency. The B-767 program is a shift to the production stage from the current development phase in FY 1982.

CSO: 4120/3 END

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7, Oct 1981